Yuba Basin Modeling Forum

Wednesday, July 21, 2004.

Welcome and Introductions:

On July 21, 2004, a meeting was held at the Bureau of Reclamation in Sacramento to discuss sharing modeling and data collection efforts within the Yuba River Basin. Sonja Wadman, Public Affairs Management, provided meeting facilitation and welcomed participants. She reviewed the desired outcomes of the meeting, which included:

- Establishing agreement on overall YBMF Conceptual Model Framework
- Hearing presentations on selected models in the Yuba River Basin
- Identifying presentations for next Forum meeting

After reviewing the agenda and providing meeting logistics, Sonja introduced Aric Lester (DWR), the Forum coordinator. He explained that the meeting participants will dictate future meeting agendas based on what topics they would like to hear about. Sonja asked meeting participants to introduce themselves and explain their involvement in the Yuba Basin.

Yuba Modeling Forum – Revised Mission Statement, Goals and Objectives:

Sonja reviewed the revised mission statement and goals for the forum. Ted Frink added that the forum website will have the mission and upcoming activities. Cutis Aikens asked a question about how one defines the geographical parameters of the Yuba Basin and whether the North Yuba River is included. Ted explained that they had originally based their definition on topographic models but that the Basin could also include extensions. He added that the definition is open to discussion and will also be based on the models that have been developed in the Basin.

Aric Lester told the group that any changes or suggestions to the mission statement and goals can be sent to him via e-mail: alester@water.ca.gov. Aric also mentioned that he began drafting a website for the group. Initially, the site will provide a centralized location to share information such as data, documents, YBMF products and activities, etc. Lorrie Flint asked if this site would house the GIS database and Aric stated that this would be a future possibility.

Yuba Basin Modeling Forum

Aric Lester and Paul Wisheropp of ENTRIX presented their conceptual framework for the Yuba Basin Modeling Forum. They explained that they had identified four main categories of study for the models present in the Basin: Physical, Chemical, Biological, and Social. These four categories are furthered divided into upland and riverine topics of study. Paul informed the group that the missing component of the framework is the web of connections between each category. The idea behind the conceptual framework is to provide a way for people to categorize where their model might fit into the bigger picture. In addition, Aric Lester noted that this is a way to show how projects are linked and how the models can be grouped.

Janet Cohen of SYRCL mentioned that she has a contact at the Tahoe National Forest who would benefit from this Forum; Janet agreed to provide the contact information to Aric. Janet also

wondered what historical information is being used because SYRCL has a lot of valuable historical information for a library. Ted agreed and said that a library of pertinent documents on the forum's website would be useful. David Christophel, CH2M Hill, commented on the use and protocol of stored documents on the Upper Yuba River Program Studies website. Participants agreed to further discuss how documents could be scanned and posted to the YBMF website.

Upper Yuba River Sediment Transport

Lorrie Flint gave a presentation on the work she has been doing on sediment flow and transport in the Upper Yuba River. She introduced the model as a series of processes and of the magnitude of flow and sediment in the Basin. Lorrie explained that she defines her study area as extending from the crest of the Sierra Nevadas to the Central Valley.

Hydrology - Processes
As an introduction to the study, Lorrie reviewed the factors associated with hydrology—precipitation from snow and rain, geology and soils, energy loads, and vegetation (which is important for evapotransportation). Lorrie commented that when measuring precipitation, she does not include anything east of the Sierra Nevada crests.

Lorrie then presented a longitudinal profile of the Upper Yuba Watershed, pointing out the great variance in elevation. She explained that in some areas the elevation is very steep, which correlates with little sediment because elevation has a correlation with evaporation. Lorrie added that soil type is key to runoff potential because the soil thickness has an impact on how fast water runs off into the stream. Janet Cohen stated that the Tahoe National Forest would have additional data on soils in the upper watershed.

Sediment – Processes
Lorrie explained that her conceptual model is of sediment supply, transport, and storage. She pointed out that mass erosion is a function of slope and that the higher the slope, the more erosion occurs. Geology and elevation have big impacts on mass erosion, particularly in the range between 1200-1800 meters, where rain and snow interact. Below 1200 meters, Lorrie explained, only rain is present and therefore mass erosion is not a big threat. Lorrie added that surface erosion is a result of roads and roads crossing streams. She noted that vegetation type, rainfall intensity, and land use all have significant impacts on surface erosion. In a map of the watershed that combines all of the factors that influence erosion, Lorrie concluded that the central section of the watershed is most susceptible to erosion. Finally, she explained that storage change will be captured in the model.

Following her presentation, Lorrie opened the floor for questions. Aric asked how the group can capture this in the conceptual framework. Lorrie said that sediment is just one part of the models being conducted in the Yuba River Basin and that the sediment portion of her presentation is in a diagram format that could be readily incorporated into the YBMF framework. The hydrology conceptual model would need some synthesis. Paul commented that in terms of the conceptual framework, Lorrie's model can be included in the categories of physical (sediment, land use), biological, and chemistry. Ted pointed out that Lorrie used many models in her study including the HSPF model and evapotransportation. He suggested that for the purpose of this group, that all models used in developing information about the watershed should be identified and shared with the group as to what information and assumptions went into the various models used. Access to the models and data sources/assumptions could be through the YBMF website. .

Conceptual Models for Restoration of Anadromous Fish Populations to the Lower Yuba River

Dave Thomas of Robertson-Bryan, Inc., gave a presentation to the group about his work on the Lower Yuba River. He explained that his conceptual model was part of a larger implementation plan of the Lower Yuba River Fisheries Technical Working Group, which is funded by YCWA and CALFED. The purpose of the Implementation Plan is to restore anadromous fish to the Lower Yuba. The geographical boundaries of his study area include the Lower Yuba River downstream of Englebright Dam.

Dave explained that the key objectives for his model are to identify factors limiting anadromous fish populations in the Yuba River and describe where the limiting factors occur in space and time. The model was done for five different fish species (fall and spring-run Chinook salmon, steelhead trout, green Sturgeon, American shad, and striped bass) located in the Lower Yuba from the confluence of the Feather River to the Englebright Dam. For this presentation Dave used fall-run Chinook salmon as an example.

Ted raised a concern about potential water quality impacts. Dave assured him that there are no water quality impacts, other than temperature, that are regarded as limiting anadromous populations based on information from biologists, surveys, and expert opinions. Ted wondered about the mercury problem that is present upstream, but Dave responded that mercury does not appear to be an issue in this location. Ted suggested revisiting that issue at a later time by tentatively connecting Dave's study to a water quality box as a placeholder when filling in the Conceptual Framework. He added that since Robertson-Bryan is internally developing "weighting" factors, that the Forum serve as a "peer review" forum to vet those factors of going into developing the weighting factors in spatial considerations and timing issues.

The concern of fine sediment possibly impacting redds, reducing egg survival, and limiting the availability of spawning habitat was raised. Lorrie responded that there is not a large source of fine sediments in this part of the watershed. Hamish Moir of UC Davis added that they have done some analysis regarding fine sediments and have discovered that it's not a significant limiting factor. Bill Mitchell stated that coarse sediments (cobbles and bed armoring) are more of a concern.

Dave then went on to discuss the timeline for the fall-run Chinook from post-emergent fry out-migration (December to March) to smolt out-migration (April – June). He added that all of the rearing occurs in the Lower Yuba before fish migrate to the Ocean or Delta.

Lorrie commented that land use is an issue for studies like Dave's in the Lower Yuba. Janet agreed by pointing out that certain developments like Lake Wildwood will have an influence on the study. Ted recommended tentatively connecting Dave's study to a land use box as a placeholder when filling in the Conceptual Framework. Bill commented that the model currently represents existing conditions and agreed that if things change, they will update the model accordingly.

Aric explained that now that the forum had heard about two conceptual models, they could work to fold them into the overall process model. In addition, forum participants need to start adding into the chart where their models fit and then we can start to look at the conceptual framework to see the connections between these two models as well as the others.

Several participants asked if the two PowerPoint presentations could be made available to the group. Dave Thomas and Lorrie Flint agreed to give the slides to Public Affairs Management for distribution. In the meantime, Ted said that Aric and Paul would work on the boxes within the framework so that people can use it to see the connections between the two models, and think about where their studies might fit within the framework.

GIS Metadata Needs and Format

Paul Wisheropp briefly explained that ENTRIX is creating a GIS database for the Army Corps of Engineers using historical aerial photographs to screen sites for Chinook salmon spawning habitat improvement projects. Paul commented that their study would likely fall into the Biological category of the Conceptual Framework. He noted that they have also examined cross-sections and pebble counts from USGS. Brendan Belby took over the discussion and guided the group through the GIS pictures and the various GIS layers and maps. He stated that one can look at this database and compare where the fish have been in the past to where they are currently in the study area. Brendan noted that they have done a one-time sampling of the number of redds in this section. He added that the points overlain on the photos match closely with actual redd locations. The photo record is extensive with photos in the database dated back to 1937 (pre-Englebright Dam).

Mark Gard and Bill Mitchell were briefly asked about their research on the lower Yuba River and possible connections to the models discussed. Bill commented that their studies differ in that they are focused on the influence of backwaters and side-channels, and that they are not specifically examining sediment or substrate. Mark stated they were not at the stage of running the IFIM model yet.

Many participants commented how valuable the spatial database is for the Yuba Basin. Paul added that everything has been GEO-referenced and attributed, making a lot of data and information readily available and useful. Brendan also displayed that LIDAR topography and bathymetry is available and is being used for input into a hydraulic model that he has developed as part of the project. In addition, he stated that they should have metadata that not only documents information but have disclaimers and assumptions. One assumption for which the group would like clarity is regarding the type/version of GIS data that is being used in the various studies (Arc View, Arc Info, and projections, etc). The group also briefly discussed the task of developing a standardized metadata format for sharing data between YBMF participants.

Next Meeting and Discussion Items:

- Next Meeting Date and Time: September 15, 1-4 pm
- Tentative Location: 2800 Cottage Way, Sacramento, cafeteria conference room C-1002
- Presentations:
    - Bob Mussetter – Work done to date on sediment transport and flood risk
    - Bill Mitchell – Biological studies in the lower Yuba River
    - Paul Wisheropp - Follow-up on metadata issue

Upcoming dates for the next six Forum meetings are:

- September 15

- November 17
- January 19
- March 16
- May 18
- July 20

Meeting Participants

Mark Gard	US Fish and Wildlife Service
Hamish Moir	UC Davis
Brendan Belby	ENTRIX, Inc.
Dave Thomas	Robertson-Bryan, Inc.
Paul Wisheropp	ENTRIX, Inc.
Aric Lester	Department of Water Resources
Cesar Blanco	US Fish and Wildlife Service
Duane Massa	California Department of Fish and Game
Ted Frink	Department of Water Resources
David Christophel	CH2M Hill
Curt Aikens	YCWA
Rob Tull	CH2M Hill
Bill Mitchell	Jones & Stokes
Bob Mussetter	Mussetter Engineering, Inc.
Lorrie Flint	USGS
Jessica Erickson	Nevada Irrigation District
Janet Cohen	SYRCL
Stephanie Hedeline	Public Affairs Management
Sonja Wadman	Public Affairs Management